Environmental Science and Waste Technology Division Applying for the Green Zia Environmental Excellence Recognition Program

Alicia L Hale, Environmental, Science and Waste Technology Division
Ware B. Hartwell, Environmental, Science and Waste Technology Division
Dianne W. Wilburn, Environmental, Science and Waste Technology Division
Michelle A. Thompson, Environmental, Science and Waste Technology Division

Business Overview

The Environmental Science and Waste Technology Division (E Division) at Los Alamos National Laboratory (the Laboratory) is a global leader in the development and implementation of environmental technologies, which solve environmental problems and lead to innovative and effective solutions for nuclear materials, waste management, and environmental restoration. In 1943, the U.S. Government established the Laboratory, LANL, as part of the Manhattan Project with an original mission to design, develop, and test nuclear weapons. The Laboratory covers 43 square miles on the Pajarito Plateau in Los Alamos County, which is located in northern New Mexico. As technologies, US priorities, and the world community have changed, the Laboratory has matured as an essential national resource for development and integration of leading-edge science and technology to solve problems of national and global importance. The Laboratory's vision of future scientific development flows from its ability to address complex problems that require integration of an array of disciplines and a variety of capabilities. As a Division within the Laboratory organization, E Division specifically supports the Laboratory's vision in three strategic areas: Natural Resources Protection and Restoration, Nuclear Waste and Materials Management, and Repository Science.

The US Department of Energy (DOE) owns the Laboratory and the University of California (UC) manages it by contract. In FY99, Laboratory staff included approximately 7,100 UC employees and 1,100 subcontractors divided among 43 division and program offices. In FY99, E Division employed 133 full time UC employees along with 83 contractors and student. Of these 133 Full-time equivalents (FTE), there is the following educational level breakdown: 36 Ph.D., 35, MA/MS, 2 JD, 3 BA/BS, and 38 Associate Degrees. The following breakdown is by type or classification: 79 technicians, 14 technical support staff, 30 specialist staff members, and 10 organizational support staff. The Division is organized roughly along lines of its major processes. An organizational chart for E Division is provided in Figure 2.

Laboratory funding for FY99 was $1.1 billion. For FY99, E Division's budget was $140 million, roughly 10% of the Laboratory's total revenue. E Division funds are used for program development, to manage environmental restoration projects, to coordinate and develop waste management activities, and to actively pursue pollution prevention opportunities. More than half of E Division's budget is allocated to subcontractors who provide environmental restoration and waste management services for the Laboratory.

E Division's nuclear materials and waste management capabilities are critical to future mission programs at the Laboratory, and best serve customer requirements when they are leveraged with capabilities of other technical divisions. E Division's work supports the Laboratory's commitment to managing the entire life cycle of nuclear materials from generation to permanent disposal while understanding and safeguarding the natural environment from a local to a global scale. (Refer to Figure 4 in Category 6.1)

The Laboratory's primary customer, DOE, focuses on four business areas: national security, energy resources, environmental quality, and science and technology. DOE has outlined seven objectives for environmental quality. The Laboratory and E Division support these areas as described in Fig 1.

DOE Objective	E Division and the Laboratory's Contribution
Reduce the most serious risks form environmental legacy of US nuclear weapons complex	Laboratory science applied at sites such as Hanford and Rocky Flats for cleanup and to develop a path forward for waste disposal.
Environmental restoration	The E Division's Environmental Restoration Project (E/ER) strives to have the Laboratory legacy site cleanup complete by 2015.
Safely dispose of waste generated by nuclear weapons and civilian nuclear research	E Division programs established the Laboratory as the first facility certified to ship to Waste Isolation Pilot Plant (WIPP) and has transferred that technology to other DOE sites. E Division is also leading a project to dispose of activated sources from across the nation.
Prevent future pollution	The Environmental Stewardship Office leads the work of minimizing waste, conserving natural resources and preventing pollution at the Laboratory.
Dispose of high level radioactive waste	E Division provides essential scientific support to the Yucca Mountain Project.
Reduce the life-cycle costs of environmental cleanup.	Various projects in E Division deploy science and technology to drive down costs of the environmental restoration effort.
Maximize beneficial reuse of land	The Environmental Restoration Program works with neighboring communities to identify and cleanup sites.

Figure 1

The Laboratory makes every effort to accomplish its mission cost-effectively while striving for an injury-free workplace, minimizing wastestreams, and avoiding adverse impacts to the environment from its operations. The DOE contract with UC includes annual performance objectives for quality of science and operations and administration for environment, safety, and health. Appendix F of this contract reflects DOE's goals for waste minimization, water and electricity conservation and affirmative procurement. Future contracts will include goals for toxic chemical inventory reduction. Permit requirements for reports compiling Laboratory progress are prepared and submitted both quarterly and annually to DOE and New Mexico Environment Department (NMED). A variety of permit requirements and various reports on environment at the Laboratory are required by regulatory agencies. One major deliverable is the annual Environmental Surveillance Report, which provides a summary of monitoring results and regulatory compliance status.

The Laboratory is committed to achieving excellence in environment, safety, and health. In meeting the moral imperative to protect employees and the environment, the Laboratory strives to achieve: zero injuries and illnesses on the job, zero injuries and illnesses off the job, zero environmental incidents, zero ethics incidents, zero people mistreatment ethics, and zero safeguards and security incidents. These are referred to as the six zeros. E Division promotes a pollution prevention ethic through sponsoring Laboratory-wide programs such as the Generator Set-Aside Fee Program (GSAF), which tax funds spent for waste disposal to use as a funding source for projects, which minimize wastes. The Laboratory procurement system is also automated to refer employees to products made from recycled content when the option is available, as well as working with suppliers to provide more of these materials. For example, one of the major office supply vendors now has a recycled product index in their catalog.

Federal and State environmental and occupational safety laws and regulations address specific requirements and standards to ensure protection of human health and environment. The Environmental Protection Agency, New Mexico Environment Department, and New Mexico Department of Labor are principle administrative authorities for these requirements. The Laboratory often exceeds its goals for environmental excellent in activities such as participating in the New Mexico Water Summit and acting on the following programmatic initiatives: instream flow, water quality, and watershed management. Other examples include pollution prevention objectives established by E Division's Environmental Restoration (E/ER) Project, which in 1999 recycled and reused over 130,000 gallons of water.

The Laboratory also supports an environmental friendly purchasing as specified by Executive Order 13101, which requires the Laboratory to purchase affirmative procurement items. These are items, which are manufactured and produced with a percentage of recycled materials. These items include, but are not limited to, paper, toner cartridges, carpet, binders, etc. Goals have been set by DOE, which will require the Laboratory to buy 95% of affirmative items on an annual basis. To meet DOE and UC Performance Measure Goals, paper and toner cartridges available via the Laboratory's on-line catalog only lists products made with recycled content. The Laboratory is also expected to work with northern New Mexico vendors in their contracts to supply the Laboratory with recycled content items.

The Laboratory supports DOE's environmental and energy efficiency leadership program. The Laboratory's efforts go beyond compliance requirements and are based on continuous and cost-effective improvements.

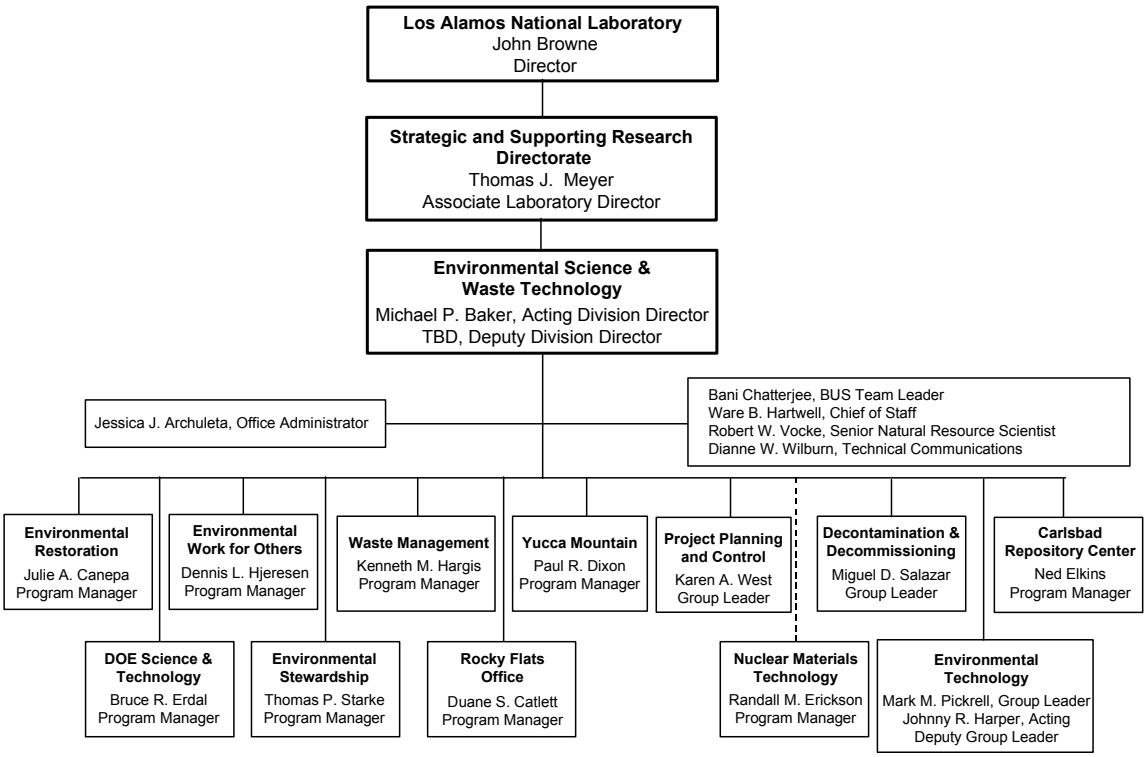

Los Alamos National Laboratory
John Browne
Director
Strategic and Supporting Research Directorate
Thomas J. Meyer
Associate Laboratory Director
Environmental Science & Waste Technology
Michael P. Baker, Acting Division Director
TBD, Deputy Division Director
Jessica J. Archuleta, Office Administrator
Bani Chatterjee, BUS Team Leader
Ware B. Hartwell, Chief of Staff
Robert W. Vocke, Senior Natural Resource Scientist
Dianne W. Wilburn, Technical Communications
Environmental Restoration
Julie A. Canepa
Program Manager
Environmental Work for Others
Dennis L. Hjeresen
Program Manager
Waste Management
Kenneth M. Hargis
Program Manager
Yucca Mountain
Paul R. Dixon
Program Manager
Project Planning and Control
Karen A. West
Group Leader
Decontamination & Decommissioning
Miguel D. Salazar
Group Leader
Carlsbad Repository Center
Ned Elkins
Program Manager
DOE Science & Technology
Bruce R. Erdal
Program Manager
Environmental Stewardship
Thomas P. Starke
Program Manager
Rocky Flats Office
Duane S. Catlett
Program Manager
Nuclear Materials Technology
Randall M. Erickson
Program Manager
Environmental Technology
Mark M. Pickrell, Group Leader
Johnny R. Harper, Acting
Deputy Group Leader

Fig. 2

1.1 Leadership Category

The leadership system that supports environmental excellence and continuous environmental improvement at the Laboratory starts with the Director's vision of the six zeros (explained in Business Overview). A comprehensive, proactive, ethics-based system cascades down from this leadership goal.

The Integrated Safety Management Plan (ISM) is the cornerstone for incorporating the six zero's. The ISM plan is the official Laboratory policy to be followed by the entire workforce. ISM sets environment, safety, and health policy for all people performing work at the Laboratory, irrespective of employer. ISM requires all work and workers meet safety and environmental responsibility requirements defined by the Laboratory requirements systems, as documented in appropriate Laboratory policy and Laboratory implementation requirements (LIR).

Environment, safety, and health are also tied to Laboratory senior leaders' performance evaluations. In addition to an ethic-based approach, these evaluations allow the Laboratory to have specific results to compare with other managers and acknowledge environment, safety, and health excellence.

The Laboratory also uses Appendix F to demonstrate commitment to continuous environmental improvement. In partnership with DOE, UC has developed specific overall performance goals, which emphasize results most important to DOE on an annual basis. These goals include environment, safety, and health. This is covered in more detail in Category 6.0.

E Division's Director stated in 1994 that his vision was the generation of zero waste from LANL operations. At his direction, E Division has been working to establish both processes and behaviors to achieve this goal of zero waste. In order to lead by example, in 1999 the Division Director and Chief of Staff initiated policy that the Division could no longer order boxed lunches for lunch meetings. This has reduced the amount of styrofoam, plastic, and cardboard waste hauled to the landfill. In addition, at the all hands meeting, the Division hired taxies to take employees to the meeting. This reduced the number of personal vehicles used thus reducing congestion and pollution. Staff is also encouraged to use the contractor provided lab-wide taxi service in their daily travel across the site. The Division also encourages employees to conserve electricity by choosing dark screen savers for computer monitors. A dark color uses less electricity than a light color.

The leadership system begins with this ethic, which is articulated in a strategic plan for the organization (discussed in Category 2). In addition to articulating a vision and set of objectives for a "sustainable" laboratory, E Division's strategic plan identifies how each individual in the organization is expected to contribute to the vision. This plan has become a cornerstone for operations within E Division and is regularly referenced at quarterly all hands meetings. It is also referenced at weekly ISM working group meetings, where environment, safety, and health issues are discussed by the ISM team for E Division. In addition, many of the group leaders have group level meetings where environment, safety, and health issues are discussed. The leadership system uses these and other meetings to review and strengthen our approach to environmental excellence. For example, ten minutes is devoted to discuss environmental issues and concerns at every all hands meeting with managers and employees. Management also took the lead in guaranteeing

environmentally sound work practices from their sub-contractors by writing waste minimization into their contact.

Program managers and group leaders meet weekly with the Division Director, both individually and in all-manager meetings. These sessions focus on expectations and progress toward goals. ISM is a standing topic at these meetings. In addition, senior leaders review action plans for all projects to ensure work is being completed as scheduled and budgeted or to determine necessary adjustments to plans. Meeting notes from these meetings are posted weekly on the Division's web page.

E Division's management system is based on frequent and open communication. The Division communicates with DOE to improve environmental performance through Appendix F reporting. Each division issues a report with supporting data on environment, safety, and health issues. This report is distributed to Environment, Safety, and Health Division (ES & H) where it is combined with the Lab-wide report. Not only does DOE use this report to measure performance of the Lab; the Lab also uses it to measure their own performance. E Division uses Appendix F to communicate their successes in environment, safety, and health. E Division uses the quarterly review meetings with DOE to gain support and possible funding for projects. These meetings provide opportunity for management to communicate their successes and request feedback from DOE leadership.

E Division's leadership also communicates environmental performance and success to NMED by meeting with the Department's Secretary quarterly. Both the Lab and Division Director participate in these meetings.

Open communication is essential with the employees as well. Based on results of a Division-wide communication survey in the fall of 1999; an action plan was developed and is being implemented to address areas for improvement. A follow-on survey and focus group are planned to insure continuous improvement in communications.

The Management Walkaround System (MWA) is another tool used by management for fostering open communication. This program provides an opportunity for management to view the working environment, target concerns and issues, and discuss with employees their concerns and issues. For instance, mangers can look for conservation measures in employees offices such as recycle bins and motion sensors for the lights as well as fire protection measures such as the location of fire extinguishers.

The Division Director also sent an e-mail to all employees encouraging them to utilize wastenot@lanl.gov, an e-mail address for environmental concerns or suggestions. For waste minimization and recycling ideas, E Division also maintains a web site with a wide range of available information for employees, customers, and stakeholders. Information regarding organizational goals and current progress cascades to individual employees through the management structure.

1.2 Leadership

Laboratory strategic planning efforts specifically address increasing public trust and confidence through corporate and personal candor, integrity, operational excellence, community outreach, and

philanthropic participation in northern New Mexico. The Laboratory and E Division leadership encourages staff to invest themselves in local and regional projects and events that strengthen the economy, environment, and quality of life, and to assist state and local agencies with solutions to difficult technical problems. Appendix N of the University of California contract with DOE supports local outreach to ensure the Laboratory is a good corporate neighbor who provides technical assistance for activities, which have a broad regional impact.

In 1997, E Division formed a Regional Involvement Leadership Team (E-Team) for Sustainability. In support of the Laboratory's mission, this team developed the following vision: "We are stewards of natural, operational, and human resources; we are an integral component of the prosperous northern New Mexico community, which preserves cultural and environmental values; and we are partners in the regional economy and contribute scientifically to understanding and solving energy and environmental problems."

Since 1997, E Division has co-sponsored several all-day workshop on sustainability for the region. Presentation topics included pollution prevention, sustainable design, strategic sustainability, water conservation, conserving electricity, DOE sustainable development efforts, and conserving bio-diversity. Participants included state and federal agencies, grass-root organizations, policy makers, private industry, and the community at large.

E Division also annually sponsors Student Sustainability Conferences. Students, staff members, and sustainability experts come together to discuss environmental concerns, issues, and success stories. The conference also includes a sustainable design contest to deal with current issues. For example, last year student participants evaluated the issue of massive construction plans on the Laboratory site. The Laboratory used results of the design contest and implemented several recommendations.

E Division representatives also participate in an ongoing local sustainability working group, "Vision Los Alamos." This group supports work to develop long term solutions to problems such as open space, water utilization, and inter-community relationships in Los Alamos and the larger region. For example, the group supports the Community Agriculture Cooperative, which includes organic farmers in the Espanola Valley. In partnership with other area leaders, E Division also participated in the National Town Meeting for a Sustainable America, sponsored by the President's Council on Sustainable Development and scheduled for May 2-5, 1999.

As a member of the shared community and to help preserve the choices of northern New Mexico and the Laboratory, the Regional Involvement Team has partnered in the following major regional initiatives:

> **Governor Gary Johnson's Blue Ribbon Task Force on Water:**
> Executive Order 99-07 established the Task Force and indicates the Task Force shall review current water policies and laws implemented within the State of New Mexico, recommend changes to existing water policies and laws, and propose new policies and laws to the Office of the Governor. The Task Force shall emphasize long-range planning relating to water use within this State. The Executive Order indicates the Task Force shall convene

through December 31, 2002. E Division co-chaired this group and served as technical advisors to the task force.

The Task Force is comprised of representatives from the following sectors: municipal, agriculture, acequia, water law and administration, industry, Native American, environmental, mineral extraction, economic development, and real estate. The Task Force, with its varied stakeholder interests, has reached consensus in several areas and has provided science-based recommendations to the Governor on: funding for the Office of State Engineer, water conservation and credits, instream flow, domestic wells, watershed management, and long-term planning. In addition, at the recommendation of the Task Force, the Governor is staffing his Office with a Special Assistant to coordinate water-related activities Statewide from the Governor's Office. The Task Force is also working with the Southwest Strategy, a joint federal office, which uses collaborative approaches to resolve natural resource and cultural resource issues in Arizona and New Mexico.

Jemez y Sangre Water Planning Council: The original impetus for regional water planning came in 1987, when a federal court ruled New Mexico's prohibition of out-of-state transfer of New Mexico ground water was unconstitutional. As a result of this ruling, it became evident New Mexico must actively plan for its water future. The resulting plans, with their forty-year horizon, will help to secure water supply continuity for future generations.

Regional water planning includes:

- inventorying quantity and quality of water resources;
- projecting water resource demands under a range of conditions; and
- determining the manner in which water requirements for the projected demands might be met with management and conservation of water supplies available to the region under existing rights, water supplies, interstate agreements, and court decrees.

As Laboratory lead in the regional water planning effort, E Division is providing in-kind services of $200,000 during the 1999-2001 period. Two Division staff members represent the Laboratory at monthly Council meetings. Some of the staff serve on the executive committee and public involvement subcommittee. Others serve on the executive committee and technical subcommittee.

New Mexico Water Summit: The E Division Regional Involvement Team participated in the New Mexico Water Summit 1: Enlibra Workshop (October 25-27, 1999). As a result of the Summit, the Water Summit Steering Committee is acting on the following programmatic initiatives: instream flow, water quality, and watershed management. The Regional Involvement Team

is also providing logistical and administrative service resources for on-going Summit-related efforts.

Green Zia at E Division

E Division supports and participates on the State of New Mexico's Pollution Prevention Advisory Council, which develops statewide programs and collaborative projects with large and small businesses. Since its inception in late 1998, the Council has developed and obtained grant funding for the following:

- technical pollution prevention resource center;
- Green Zia Environmental Excellence Program fashioned after the Malcolm Baldrige Quality Award program;
- industry-specific process tools and fact sheets to facilitate waste minimization; and
- training program for using standardized waste minimization tool set developed by Harvard's Robert Pojasek.

The Team also served as examiner trainers, examiners and judges in the Green Zia Program's first year. From the lessons learned from 22 organizations participating in its inaugural year, a core team of four individuals from across the state including two E Division staff was formed in the fall of 1999 to evaluate and improve the program. E Division staff invested many volunteer hours so the program used this year is streamlined and tailored to New Mexico businesses, which tend to be small and lack resources for significant investments in pollution prevention.

In addition, E Division has placed graduate students (in public policy, chemistry, and journalism programs) to support NMED in developing specific tools to expand the usefulness of the Green Zia Program across the State. Their efforts have resulted in the development of industry-specific pollution prevention checklists, systems flow charts, and promotional literature about the program.

Green Zia at Los Alamos:

Of course, it is essential to "walk the talk" in regional involvement and the E-Team can be credited with leading the Laboratory's involvement in activities described above. First, in 1999, E Division submitted and won two Green Zia Awards at achievement and commitment levels in environmental excellence. The Division also consulted with the Dynamic Experimentation Division to submit a Green Zia Award. They won a Commitment Level Award. In addition, due to E Division's success facilitating the Green Zia Program, eight Laboratory organizations will submit applications this year.

Green Zia Awards and applications are just a start for the Laboratory. Our long-term goal is to achieve the "Excellence" level for Los Alamos National Laboratory. The Figure listed below illustrates the Laboratory plan to integrate the Green Zia approach.

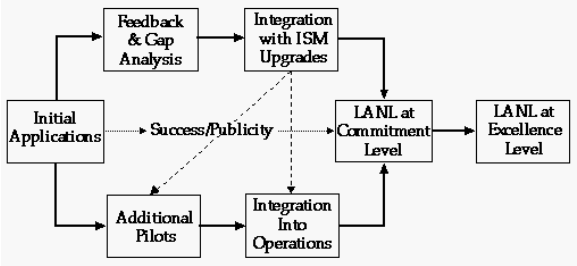


Figure 3 Deployment of Green Zia approach.

In addition, the Division's Environmental Stewardship Office (E/ESO) is leading the effort to achieve an "excellent" rating in UC Contract Performance Measures to use the Green Zia tools in five different projects.

In order to communicate with customers regarding environmental improvements, E Division uses DOE Citizens Advisory Board (CAB) to include the community in Laboratory's activities. DOE selected the members of the CAB to include community leaders and Laboratory staff. The CAB provides the citizen prospective on Laboratory operations. E Division staff and the public attend these meetings. The meetings are held monthly to update citizens about E/ER and E Division's Waste Management (E/WM) Program objectives and environmental issues. Further, E Division has regular availability meetings with elected officials in order to understand community needs. These meetings provide an opportunity for the community to meet with elected officials and voice concerns regarding environmental improvements. In addition, E Division depends on NMED, pueblo leaders, and elected officials to provide them with community input.

Because customer input is key to success, E Division uses and solicits customer feedback through meetings to demonstrate current E Division projects and by volunteering in the community. To further understand public perception, since 1990 LANL has conducted annual surveys of public opinion. The resulting reports profile New Mexico residents' views and identify results from specific geographic areas around the state as indicated in Category 7. In addition to asking about general perceptions of LANL, the survey specifically asks respondents their opinion of LANL's environmental responsibility. Results from the survey are recorded, analyzed, reviewed, and used for planning future activities.

To communicate with customers, stakeholders, and suppliers, E Division uses its World Wide Web site. By using photographs and text as well as frequently updated statistics, E Division keeps all parties well informed of current progress and plans. Most program offices within E Division also have their own web sites and provide extensive information on status of current projects, regulatory controls that impact operations, schedules of for public meetings, and names of contacts. In addition, E Division has direct contact with stakeholders through site tours. Additionally, information is disseminated via written reports, press releases, fact sheets, briefings to group and agencies, and public meetings.

2.0 Planning for Environmental Excellence

2.1 Strategic Planning for Environmental Improvement

Strategic planning is a top down process at LANL beginning with Congress and the President. The current LANL strategic plan (available online to both the public and LANL employees) sets out major programmatic objectives and strategies. The plan also identifies environmental objectives related to most LANL major goals. A major objective of demonstrating operational excellence in all activities specifically calls out the following strategies:

- achieve measurable improvements in safety and environmental stewardship through full implementation of ISM throughout LANL; and
- manage waste and hazardous legacy materials effectively and accept the challenge of minimizing the generation of hazardous wastes in the future, with a long-term direction toward zero emissions.

Each year LANL also produces an Institutional Plan, a five-year future look on LANL operations. This document (also available to the public) identifies strategic requirements for LANL organizational units, including E Division. The document summarizes programmatic and operational plans and helps ensure integration of LANL activities with DOE priorities. Based on LANL strategic directions and DOE requirements, E Division then develops its own strategic plan. The current vision E Division has for its activities states: "In support of the Laboratory's mission, we are stewards of natural, operational, and human resources. We are partners in the regional economy and contribute scientifically to understanding and solving energy and environmental problems."

The most recent version of the E Division strategic plan is entitled *Roadmap to Sustainability* and was published in 1998. This is being replaced with a more current version that is being finalized. The major thrusts areas identified are Repository Science, Nuclear Waste and Materials Management, and Natural Resources Protection and Restoration. To develop this plan, teams were formed to address each of these thrusts. E-mails were sent to all employees encouraging their participation in the meetings or on a team. Each organization is now identifying how it will contribute to achieving this strategic vision within E Division while delivering the results expected by DOE.

2.2 and 2.3 Action Planning

E Division has been developing an implementation strategy for ISM, focusing on involving all employees to make this program a routine part of all operations. The Division is currently implementing environmental excellence (EE) throughout the Division's ISM plan. The goal is to use this plan as a cornerstone for implementing EE throughout the Laboratory's ISM plan (ISM/EE). The Division's document includes employees' roles and responsibilities in integrating ISM/EE into their daily routine. E Division strives to incorporate a strong environmental and safety ethic into its culture. To help initiate this, the Division developed a presentation so group leaders can brief employees on the most important aspects of the ISM/EE plan. Furthermore, E Division developed an ISM web page that describes core aspects of ISM and EE. This web page is available to all E Division employees and managers encourage their employees to view the web page for up to date

information. In combination with the leadership systems previously described, these efforts then set the stage for development and execution of tactical action plans.

Action planning is conducted for both programmatic scope as well as the conduct of operations. The contract developed between DOE and UC supports environmental excellence by specifically identifying the scope of work and associated costs for each year. Commonly referred to as a programmatic baseline, this plan provides detailed descriptions of ***what*** activities will be conducted and the resources required. Established through an exhaustive planning process that identifies all the environmental work yet to be done, the baseline assures DOE resources are appropriately aligned for the current year to accomplish work with highest priority. E Division's Project, Planning, and Controls Office (E/PPC) creates a highly detailed project or action plan for each environmental or waste management activity included in the annual baseline. The plan includes resource and cost details that allow managers to project activities down to the individual worker level. How the Division involves stakeholders, vendors, customers, and other interested parties in their strategic plans is addressed in Category 3.0.

E Division also must ensure safe and compliant operation of facilities it manages on both a short-term and a long-term basis. Operational plans include the following:

- facility management plans;
- configuration management plans;
- facility safety plans;
- quality assurance plans;
- emergency action plans;
- training program description and job analysis; and
- maintenance implementation plans.

E Division's nonreactor category II nuclear facilities require even more stringent plans such as a Safety Analysis Report (SAR). The SAR describes ***how*** all the activities are being done and postulates safety scenarios that could impact the facility and how those scenarios would be managed. Several other plans are also produced from the SAR. These include:

- fall protection plan;
- fire protection plan;
- joint environment and safety plan;
- industrial and radiation monitoring plan;
- project management plan;
- procurement procedure;
- storm water pollution prevention plans; and
- spill prevention plans.

All of the above plans include a formal change control process to manage communications, distribution, and training requirements.

DOE provides an Annual Performance Appraisal of institutional performance. The Laboratory takes this feedback and develops action plans to meet goals. The Lab and DOE review plans if it is an

institutional issue. If it is a division or group issue, DOE informally participates in the review process.

Action plans are typically designed to include activities over several years. E Division senior leaders review plan projections against actual performance on a regular basis (see Category 1) and use the analysis to improve performance projections. Through a formal change control process, as cost or process improvements in the activity are made, resources can be reprogrammed to take advantage of savings. Both time and financial resources are considered in this reprogramming effort.

The Laboratory also has an institutional pollution prevention plan. This plan is developed by E Division in partnership with DOE and defines the strategy for preventing environmental impacts from current Laboratory operations. The plan describes Laboratory management systems, the main wastestreams generated during operations, and strategies for reducing waste with goals and objectives to monitor that strategies are working. The partnership revisits this plan yearly.

E Division also depends on internal and external audits for developing action plans. For example, during an NMED inspection, inspectors identified unlabeled waste materials. The Division conducted root cause analysis and corrected the issue of mislabeling material by consolidating chemical storage sites so it is easier to track and assure properly labeled chemicals.

As stated earlier, ISM is the cornerstone for environment, safety, and health issues. E Division uses lessons learned from ISM/EE to improve the review process of the plan. Since E Division reviews and revises this plan annually, it provides the opportunity for the ISM weekly working group to incorporate lessons learned into the new plan. It was through this process that the team decided to incorporate additional employees' roles and responsibilities for environmental excellence.

3.0 Customer, Market, and Stakeholder Focus

3.1 Customer Involvement

Just as frequent and open communication marks E Division's internal management practices, so does it characterize interactions with customers and stakeholders. Historically, LANL and E Division have perceived DOE as a captive market. This attitude has shifted significantly in the last five years. Although DOE might be a captive market, UC is not necessarily the only organization that can provide environmental science and waste technology services at LANL. As a result, E Division is much more conscious of improving the efficiency of work, integrating with other vendors, demonstrating excellence in science and technology and exhibiting sustainability ethic in daily operations.

The performance measures found in Appendix F of UC's operating contract provide clear expectations, increase accountability, and improve customer relations by addressing performance issues that concern DOE. Several measures that relate to environmental excellence fall within the functional area of environment, safety, and health. Negotiation steps for these measures, process to set priorities, improvement steps, and resulting evaluations (see Figure 5) all help focus E Division resources on key business processes, improve operational quality, and increase the effectiveness of external oversight by sharing performance results with E Division's key customers.

In order to support environment excellence efforts at other DOE sites, E Division provides advice and environmental consulting services for DOE operations at Rocky Flats outside of Denver, Colorado, and to the Yucca Mountain Project in Nevada. In addition, E Division's Science and Technology (E/ST) Program helps DOE develop state-of-the-art environmental remediation techniques for use around the nation. The Program uses science and applied research to develop technologies that make environmental clean-up faster, better, safer, and more cost effective. E Division's Office conducts environmental work for other national and even international customers to create an eco-efficient society for the 21st century. Under this leadership, LANL has become EPA's lead laboratory for green chemistry programs. This program identifies environmentally friendly substitutes for toxic or hazardous materials. One initiative includes a recently concluded series of five educational conferences involving industry, government agencies, and research community. .

Additionally, E/ST has formed partnerships with several universities and other national laboratories. These partnerships allow each organization to apply their unique expertise and build a complementary, integrated solution to tough environmental problems. An example of such a partnership addresses disposition of nuclear materials. The Laboratory is DOE lead for the Nuclear Materials Focus Area (NMFA). NMFA is a partnership with DOE's Idaho Operations Office and Albuquerque Operations Office; formed by merger of the Plutonium Focus Area in the Office of Science and Technology, and the Nuclear Materials Stewardship Technology Development Program in the Office of Nuclear Materials and Facility Disposition. E Division recognized the need for a concerted, dedicated development program to address various issues and problems concerning disposition of nuclear materials within the purview of the Division. This program also addresses Nuclear Materials management safety and concerns raised by the Defense Nuclear Facilities Safety Board. Problems and issues associated with nuclear materials have significant implications towards meeting the goals and milestones for accelerated cleanup.

3.2 Supplier Involvement

E Division works with contractors and vendors to improve environmental performance. The initiative has begun a partnering with the New Mexico Environmental Alliance, a partnership of state, local, and federal agencies: academia; private industry; and environmental advocacy groups- to implement the philosophy of the Green Zia Environmental Excellence Program. The major subcontractor at the Laboratory is Johnson Controls Northern New Mexico (JCNNM). The Division works with JCNNM to employ several waste minimization programs. For example, the Division implemented a cardboard recycling program through JCNNM. This has contributed to significant reductions in cardboard waste (see 7.0). Another example is JCNNM is using the Green Zia Tools to analyze why spills occur and to prevent future spills. In addition, this year E/ESO worked with another major sub-contractor, ARAMARK Corporation, the main food service provider for the Laboratory. For example, E/ESO is assisting ARAMARK to acquire funding to purchase a new grease trap to prevent future grease trap overflows and to reduce sanitary waste.

To support purchasing materials comprised of recycled materials in support of Executive Order 13101 signed by President Clinton on September 14, 1998, and to comply with the Resource Conservation and Recovery Act (RCRA), the Laboratory is purchasing products made with recovered materials. The purpose of the Executive Order and the Laboratory's affirmative

procurement program is to develop a large market for green products by encouraging local businesses to develop and supply these products. E/ESO took the lead to ensure affirmative procurement is implemented throughout the Laboratory. The items include, but are not limited to, paper, toner cartridges, carpet, binders, etc. Goals have been set by the DOE, which will require the Laboratory to buy 95% of affirmative items on an annual basis. To meet DOE and UC Performance Measure Goals, paper and toner cartridges available via the Laboratory's on-line catalog only lists products made with recycled content. In addition, the procurement office encourages vendors to include more products made from recycled products and to limit the amount of packaging used with products. Furthermore, the procurement office is working with Business Operations Division (BUS) to implement environmental standards into contracts. In 1997, the Laboratory had an affirmative procurement rate of less then 20%. Due to E/ESO, BUS, and Computing, Information and Communications Division (CIC) efforts, in 1998, this percentage increased to 92%. The team worked a graded approach, concentrating on the largest category first, paper. For example, effective April 1, 1999, Laboratory policy required paper products be comprised of a minimum of 20%-recycled material. Since most of the paper is purchased through an online system, the team blocked the purchase of virgin paper on the system.

3.3 Others Involvement

The Laboratory works with environment, health, and safety agencies to manage compliance by preparing and submitting reports demonstrating Laboratory progress both quarterly and annually to DOE and NMED. A variety of permit requirements and various reports on environment at the Laboratory are required by regulatory agencies. One major deliverable is the annual Environmental Surveillance Report, which provides a summary of monitoring results and regulatory compliance status. As stated in Category 1.2, E Division also works with the CAB to report the Division's goals and progress.

4.0 Information Analysis

4.1 Information Collection and Management

Various institutional databases track environment, health, and safety performance. These systems also provide data for environmental monitoring for regulatory reports, modeling, and analyses. For example, the E/ER project uses Facility for Information Management, Analysis and Display (FIMAD) to target areas that need environmental restoration. They also use FIMAD to report their progress to DOE. The systems are in place for Appendix F, Environmental Safety and Health Identification (ESH-ID), Audits and Assessments, ISM, and Benchmarking Processes (see Category 6). DOE relies on these systems to manage information and achieve environmental excellence.

Appendix F goals are essential performance indicator of our contractual requirements and also a measure of customer satisfaction (see Figures in Category 7.0). Managers monitor progress related to project and performance goals and use that information to develop and/or modify operational plans and to identify areas for improvement.

The Lab and E Division also use the ESH-ID process to determine environment, safety, and health requirements associated with all potential projects that may affect environmental performance or operations. This is explained in more detail in Category 6.0.

LANL senior leaders also monitor progress toward full implementation of ISM. The ISM Project Office has established a detailed implementation schedule and monitors all portions of LANL, including E Division, to ensure milestones are achieved and performance goals are met.

In addition, E-Div uses information from the Audits and Assessments Office (AA) that provide an independent review capability for the Laboratory Senior Executive Team. As such, AA is an important element in management of the Laboratory. The AA mission is to provide management with reasonable assurance through audits, assessments and evaluations that Laboratory operations and business practices are continuously improved, resulting in the reduction of Laboratory costs, decreased external oversight, and cost effective compliance with internal and external requirements. Internal and external audits are conducted within E Division. These services provide information in the following areas: economy; efficiency; effectiveness; financial integrity of E Division's programs; and performance in the areas of environment, safety, quality assurance, maintenance, security, and facility management. AA Experts question employees about current operations. Experts develop a report providing feedback about their findings and recommendations. From the report, a Corrective Action Plan is developed and tracked through I-Track, the Laboratory wide action tracking system.

In addition, E Division also works with AA to conduct MWAs and develop new guidance cards that address environment, safety, and health issues in the MWA system. For example, E Division partnered with AA to develop a new guidance card for general site condition and clean-up. The team conducted a MWA on several facilities. From these observations, the team helped develop a new guidance card to ensure grounds around the facility/building are absent of trash, spent equipment, and litter.

The Laboratory has also embarked on a benchmarking effort to compare environmental programs at public and private facilities nationwide. This was done because several DOE sites (including LANL) have mature environmental programs and the Laboratory wanted to compare their programs to others. The Benchmarking Project Team put together a report, which illustrates attributes of environmental excellence identified by the team and presents a summary of findings and recommendations for further improving environmental management. Currently, the benchmark is completed only through Phase 1. Phase II will evaluate successful proactive environmental policies beyond compliance, including the prioritization of voluntary commitments and development of implementation plans with appropriate metrics to measure progress toward goals. Phase II will also identify and compare successful strategies for implementing line management accountability and recognizing outstanding environmental performance in a complex R&D environment.

4.2 Analysis and Decision-Making

E Division uses several tools to gather information and make decisions. These tools include Green Zia assessments, road mapping, databases, community meetings, reports, and surveys. The Green Zia assessments are described in more detail in Category 6.

The Division decided to use the Green Zia assessments to determine the extent and efficiency of purchasing computers to develop steps for reducing this waste. This is an important issue for E Division because waste material is generated as a result of manufacturing a new computer as well as disposing of an old computer. Before viewing trend data, the Division hypothesized computer purchases were tied to fluctuations in number of employees. The Division then received the information from BUS on the cost of purchasing computers from fiscal years 1997-2000. After reviewing data, it showed no relation to number of employees and computer purchases. The data showed computer purchases consistently peak at the end of the fiscal year. The Division will pursue this issue through its management meetings to develop a conservation strategy.

Another illustration of continuous quality tools is the road mapping analysis. E Division gathers cradle to grave information about wastestreams from all over the Laboratory each year. This information is used to develop a road map illustrating environmental stewardship throughout the Laboratory. It describes current operations, improvements that will eliminate the sources of environmental incidents and the end-state that is the Laboratory's goal. The 1999 version of the roadmap is an amendment to the Laboratory's 1997 Site Pollution Plan, and it is certified, along with that Plan, to satisfy requirements of 40 CRF 264.73(b)(9). The wastestreams viewed are transuranic, low-level, mixed low-level, hazardous, solid sanitary, construction, water, and energy waste. This map is used to make decisions because it lists projects that need funding and implementation to reduce these wastestreams. For example, the road map identified food waste as a significant wastestream for the Laboratory and there is no current program to recycle the waste.

E Division maintains extensive databases related to environmental information for the Lab as an institution. This data ranges from measurement of progress toward goals for routine waste minimization for various waste types to percentage of sanitary waste recycled. E Division uses this data to target significant waste generators. Once targeted, the Division routinely manages, facilitates, and consults with these organizations to minimize waste and prevent pollution. A part of Laboratory success of reducing waste is E Division's ability to effectively manage data and use data to help other organizations develop plans to meet Laboratory waste minimization goals (see Figures in Category 7.0).
The Division also gathers information from community meetings. Program managers and other E Division senior leaders hold these meetings. These meetings are monthly to quarterly depending upon the issue. The ER Project took the lead in these meetings in 1991. In 1994, members of the public were invited to brainstorm informally on ways to obtain more effective public involvement and resolve historic problems of lack of trust and the traditional, one-way manner of providing technical information. Three concepts emerged during that session:

- involving the public in a dialogue is more valuable than presenting draft information and asking for "public comment;"
- reviewing what has worked at other facilities avoids "reinventing the wheel;" and
- sending teams of Environmental Restoration Project technical staff and experienced interviewers into the community to listen and respond can provide helpful suggestions to resolve problems related to trust, honesty, and openness.

Since these meetings, E Division has done extensive work (discussed in Category 1.2) to address these concerns.

E Division also monitors progress against project goals for E Division program offices. Reports, which in some cases include progress in specific pollution prevention activities and upstream waste minimization efforts, are provided monthly. Program managers also provide E Division senior leaders with more up-to-date but less formal progress reports in weekly management sessions.

5.0 Employee Involvement

5. 1 Employee Education and Skill Development

E Division uses training, ISM, the Performance Management Systems, and career development programs to ensure every employee understands his or her role in achieving institutional goals. Each employee has a training plan. The ISM implementation strategy currently being executed for the Division will emphasis employees' understanding and involvement. In addition, as stated in 2.2, the ISM presentation will ensure that employees know roles and responsibilities associated with their job tasks.

E Division managers are also responsible for preparing individual training programs for each employee on an annual basis as part of LANL's Performance Management System. This system requires E Division groups and programs establish objectives, which support the overall organizational goals. Objectives for each employee are developed collaboratively and designed to ensure organizational objectives are met and employees have a clear view of how their work requirements contribute to the success of the entire organization. The Performance Management System ensures clear two-way communication during the goal-setting phase of the process and provides a focus for ongoing discussion about work objectives and processes.

E Division employees may also participate in LANL's institutional career development programs, which helps identify skills gaps and excesses and provides training to address them. Employees can choose to enhance their existing skills or to further develop other skills that LANL needs now or for future programs. For example, the Laboratory initiated classes this March to enhance Technicians' career opportunities. The classes include resume writing, interview skills, networking, and key mechanisms to identify career choices and career satisfaction. These courses are available to all employees.

E Division also brings onsite training for employee enhancement. For example, in March, 2000,the Division held a course on mistake-free grammar and proofreading. The course was open to administrative employees as well as staff. Another example is E Division has conducted several two-day training sessions on Seven Habits of Highly Effective People. This course is an avenue for organizations to empower employees to be more effective in their jobs. The course provided the opportunity for open discussion among employees and established more team building. E Division has also held courses on improving presentation skills. Since presentations are a significant tool for marketing, this class has helped the Division communicate the importance of pollution prevention and waste minimization throughout the Laboratory.

In 1999, E Division developed a Laboratory-wide presentation communicating electrical conservation and sanitary waste minimization options within an office environment. The presentation has been presented throughout the Laboratory. Many employees thanked the Division for presenting this information. The presentation helps people understand how to use options available and provided opportunities to ask questions about options for conservation. Handouts from the presentation were distributed electronically to all Laboratory employees. Changes in employees "habits" are expected to have potential savings of $1M in electricity costs, avoid exceeding the Laboratory's electric power contractual rights, and reduce amount of CO_2 and other pollutants released into the atmosphere from power generators. It is also expected to keep 300-500 metric tons of paper out of the landfill, avoid $100K per year of paper costs, and recycle 100% of the Laboratory's cardboard waste. These conservation options help the Laboratory achieve UC waste/recycling performance measures.

In addition, E Division decided to insert systems for conserving electricity and reducing waste into its ISM/EE plan. This will ensure employees use these options in their day to day operations. The Division also decided to create a guidance card emphasizing electrical conservation and sanitary waste minimization. Once the card is complete, managers will conduct one MWA quarterly, which reviews energy, water, paper, and chemical issues.

Training programs are components to assure actions by workers reflect plans. E Division employs several training generalists who work with managers and employees to identify specific training requirements for work being performed, establish appropriate programs, enhance quality, and assure continuity for all aspects of training. Training on standardized practices such as hazardous material management or emergency operations is conducted on a LANL-wide basis. Site- and task-specific training is also provided for E Division projects and facilities. To assure an adequate safety envelope and compliance with laws and regulations, E Division facilities must produce several operations plans and risk-reduction plans. Category 2 outlines these short- and long-term approaches and demonstrates the comprehensive measures used to ensure employee well-being.

One new key element of the training program is inclusion of Green Zia tools for environmental excellence. E Division helped in development of tools for NMED and piloted their early use. E Division now offers training in use of the tools and facilitation for Green Zia improvement process to its staff as well as other divisions and programs across LANL.

5.2 Employee Involvement

Employees are involved in all aspects of the environmental management system through MWA, the road maps, ESH-ID, Appendix F, wastenot@lanl.gov, Green Zia Assessments, ISM weekly, and daily meetings. Each of these systems is described throughout the application. Meetings are key ways to receive employee input. Many process improvement ideas discussed in Category 6.2 came from employees during daily and weekly meetings. At every staff meeting, E Division employees provide input on projects and environmental issues. For example, the E/ESO manager was about to submit his end of the fiscal year funding request for pollution prevention projects and asked employees to choose which projects they want funded. Through this process the manager proposed funding to upper management for a Lab-wide cleanup of facility grounds.

5.3 Employee Satisfaction, Value and Well-being

LANL senior leaders chartered the Employee Advisory Council (EAC), which is composed of volunteers from each division including E Division, who are committed to making the Laboratory a better workplace for all employees. The purpose of EAC is to serve as a communication link providing employee input, feedback, and recommendations to LANL management on existing and proposed LANL policies, practices, operations, and procedures. EAC also identifies issues of employee concern and communicates these issues and possible solutions to LANL management.

There are also incentives to encourage staff to work smarter and utilize alternative resources to accomplish their work. The Pollution Prevention Awards Program, sponsored by E Division but open to all LANL employees and subcontractors, is designed to encourage individuals and teams to develop plans, programs, or ideas for minimizing waste; conserving water, electricity or natural gas; reducing air or water pollution; or procuring products with recycled content. Recipients of the awards receive recognition and a cash grant from specially allocated congressional funds.

The Laboratory also gives Distinguished Performance Awards to employees and teams for outstanding performance in managing their projects. Three projects and one employee from E Division were nominated last year. Three of these nominations won the award. In addition, starting in 1999, the Division now gives cash awards to employees for going beyond their job duties in environment, safety, and health areas.

The Environmental Stewardship Office funds organizations through the Generation Set Aside Fee Program for more efficient equipment or projects that contribute to source reduction. When organizations win, E/ESO publicizes the winners on the E/ESO web site and electronic News Bulletin.

The Los Alamos Awards Program and contractor Award Program, administered by LANL institutionally but used at the division or program level, provides a link between organizations' mission and those employees or teams that achieve significant accomplishments toward that mission. E Division managers use the program to recognize exceptional contributions and noteworthy achievements by awarding their employees, either individually or as teams, with cash awards ranging from $250 to $2000.

6.0 Process Management

6.1 Process Characterization and Control

How E Division executes its mission is described below. The center circle is the Division's core business activities such as Environmental Restoration Oversight, Waste Management Oversight, Pollution Prevention, etc. The circles surrounding the mission are common processes used to conduct Division activities. The lines extending from the circles are how the Division carries out these processes. For example, the Division executes the Safety Management portion of E/ER oversight through Guidance Cards, MWA, ISM Plans, ISM Working Group Meetings, etc. In other

words, the circles are the **whats** and the lines are the **hows**. The five **whats** are Project Management and Execution, Continuous Quality Tools (CQT), Communications, ISM, and Human Resource System. The following is a brief discussion of how each core activity is conducted.

One of the core mechanisms to manage the mission is through project management and execution. The Plan of the Day and weekly management group meetings are activities used to conduct this process. These activities help identify environment, safety, and health requirement, impacts, and issues. For example, the Transuranic Waste Characterization Project (TWCP) team had to meet the WIPP Waste Acceptance Criteria (WAC). In order to meet the criteria, the team had to accomplish four objectives: 1) reduce the amount of Plutonium 238 (Pu-238), 2) certify the amount of plutonium in each drum; 3) place the drums into Standard waste boxes (SWB) at one drum per SWB; and 4) remove all but one layer of confinement around the waste. During one management weekly meeting, the team decided how to accomplish these objectives by repackaging waste. The idea will also reduce 140 cubic meters of TRU waste.

Under ISM activity, the ESH-ID Review Process assists line management in meeting the quality expectations of the ISM Program. All potential projects must conduct an ESH-ID report. The ESH-ID process helps characterize new projects by providing a project profile that includes information related to:

- administrative issues;
- purpose and type of project;
- location and site information;
- potential impact to site and facility systems;
- environmental factors; and
- safety and health factors.

Once the form is complete, the Environment, Safety, and Health (ES&H) Division reviews it to determine if the project should be executed. If they do not approve the project, the manger can change the project to meet the requirements or cancel it.

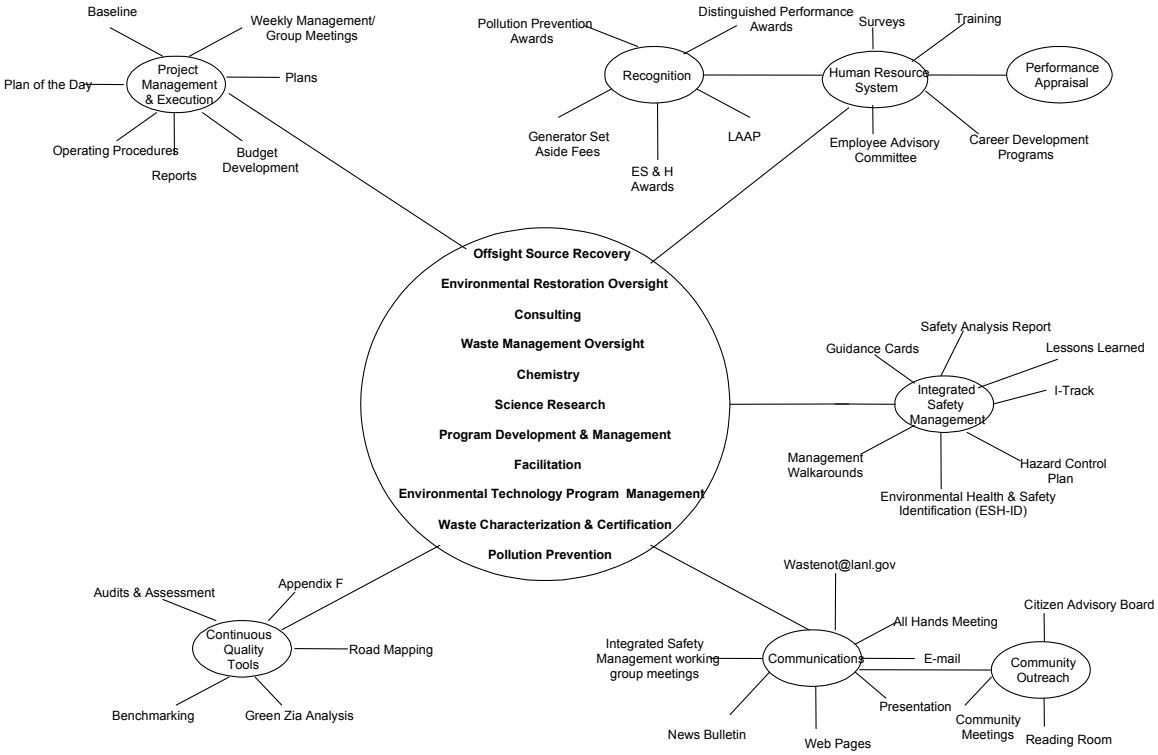


Figure 4 - Conduct Core Business

Another process used to execute work scope that is also key to integrate environment, safety, and health issues is Communications. The ISM working group meetings ensure these issues are communicated throughout the Division. The meetings are weekly and each staff member communicates the latest issues pertaining to environment, safety, and health. These issues are then communicated to the rest of the Division through e-mails, the web page, and all hands meetings.

The Division also uses Continuous Quality Tools to identify environment, safety, and health issues. For example, an internal assessment was conducted after repeated incidents during E Division's well drilling operations and several safety issues were identified. E Division addressed them by conducting a stand down and procedure rewrite to prevent future incidents**.**

6.2 Process Improvement

CQT, ISM, Human Resource System, Project Management and Execution, and Communications are also used to continually improve the mission. The activities to enact these processes include Green Zia Assessments, Appendix F, Plan of the Day and Weekly Management Meetings, etc. Most of these processes have been described in the application.

A central part of improving the mission is through CQT. There are several tools the Division uses, but a significant one is Green Zia assessment. The Division uses the application, the feedback report, and the Green Zia Tools to continually improve. For example, the Division decided to use Green Zia criteria as a framework for integrating environmental excellence throughout the ISM plan.

As shown throughout this application, Appendix F is another important Continuous Quality Tool. The Division uses this process to continually renegotiate and improve environment, safety, and health goals (see Figure 5). Improvements are fed back into the negotiation process yearly. UC, DOE, and staff throughout the Laboratory are involved in negotiating performance measures. Below is a diagram illustrating the negotiation process.

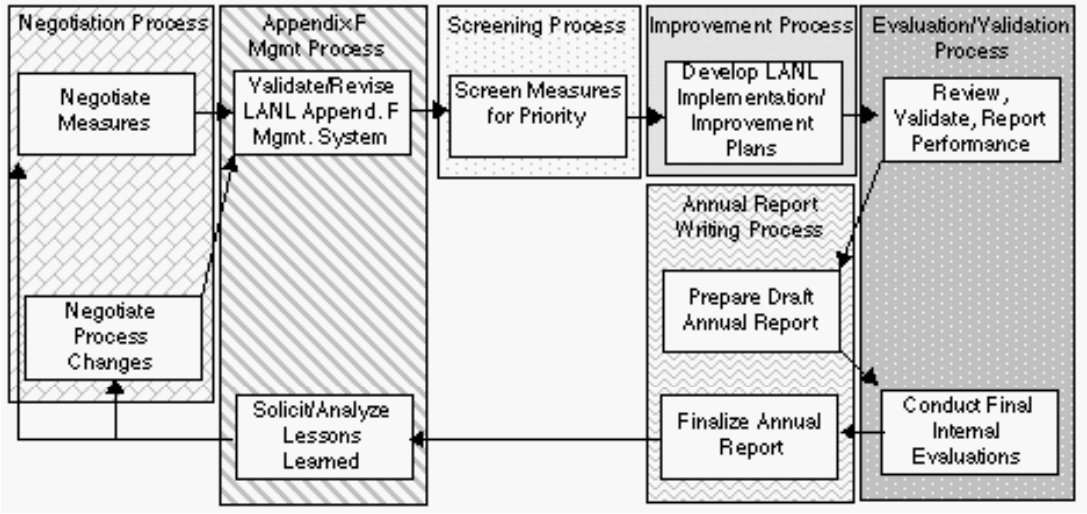


Figure 5. Appendix F Process (18-month continuous cycle.)

A further important CQT is benchmarking. To develop new markets and convert wastes to products, E Division is measuring its progress as a best-of-class operation, benchmarking its activities and operations against other exemplary programs, and refining its processes. DOE and E/WM have developed several performance objectives to achieve this best-of-class ranking. By identifying Laboratory operations for future environmental improvements, reducing potential for shutdowns and fines, and improving productivity by minimizing wastes expensive to dispose, E Division has demonstrated the Laboratory's commitment to the best environmental practices. By benchmarking against baseline technology, E Division creates more environmentally sound products, processes, and services. Benchmarking is particular important for waste characterization process because waste must be properly characterized before shipped and disposed at WIPP. Currently, the Division compared their waste characterization technology to private and public sector technology. The Division's technology rated higher than any other (see Category 7.0).

Another main process for improvement is program management and execution. As stated above, the Division employs weekly and daily meetings to improve operations. These meetings provide employees and managers opportunities to discuss environment, safety, and health improvement ideas. For example, Material Disposal Area (MDA) P Closure Project is a remediation project undertaken by E/ER. The project involves removal of approximately 35,000 cubic yards (CY) of contaminate soil and debris from edges of Canon de Valle. At weekly and daily meetings, the E/ER team came up with the idea to reduce waste volumes through various recycling and reuse initiatives. This is estimated to save the Laboratory approximately $340K. The team accomplished waste volume reductions such as reducing 3,660 CY of soil, 2,600 CY of concrete, and 1,800 CY of scrap metal.

For example, in concert with DOE, E/ER recently developed a new baseline, which redefined its technical approach to complete cleanup activities. Under the revised approach, the Laboratory groups and schedules E/ER activities for potential release sites (PRSs) to restore an area based on watersheds. The Laboratory prioritizes E/ER work in these aggregates based on health risk reduction and uncertainty reduction (e.g., characterizing complex sites as soon as possible). The approach integrates human health, ecological, surface water, and groundwater considerations within a common decision framework. This approach provides for proactive, frequent interaction with regulators and stakeholders and real-time review of work by NMED. The E/ER Project may now effectively tier to the Laboratory Institutional Watershed Management Plan, the Groundwater Protection Plan, and the developing Biological Resources Management Plan. The E/ER Project will transfer sites to the Laboratory, which will require controlled long-term surveillance at the time of Project closeout.

7.0 Results

7.1 Environment Results

E Division measures environmental results and benchmarks these results with other organizations at the Laboratory. The Laboratory uses the performance measures in Appendix F of the DOE contract with UC to assess annual performance objectives for environment, safety, and health. Appendix F of this contract also includes DOE's goals for waste minimization, water and electricity conservation and affirmative procurement. The Laboratory prepares an annual report for these performance measures and receives a rating from DOE based on a scale of 0 to 100. Figure 6 shows the results for environment, safety, and health performance ratings for the past three years.

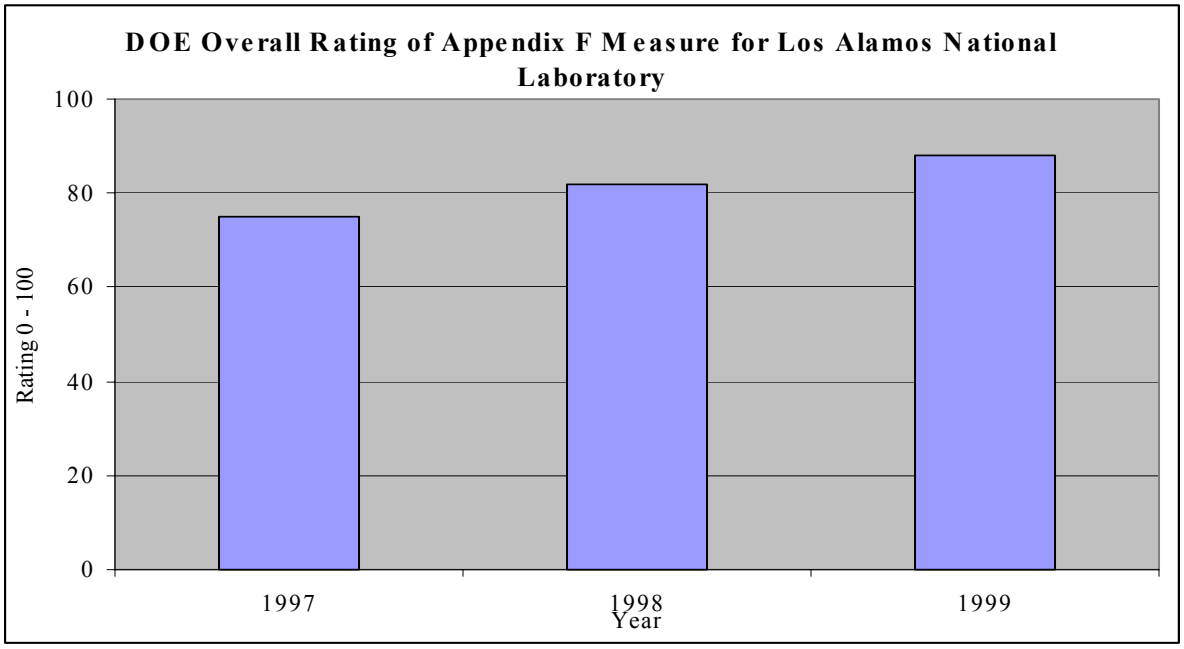


Figure 6 Appendix F Rating

The Laboratory has continuously improved its performance in waste generation minimization, environmental improvement, regulatory compliance, and workplace safety as reflected in Figure 6.

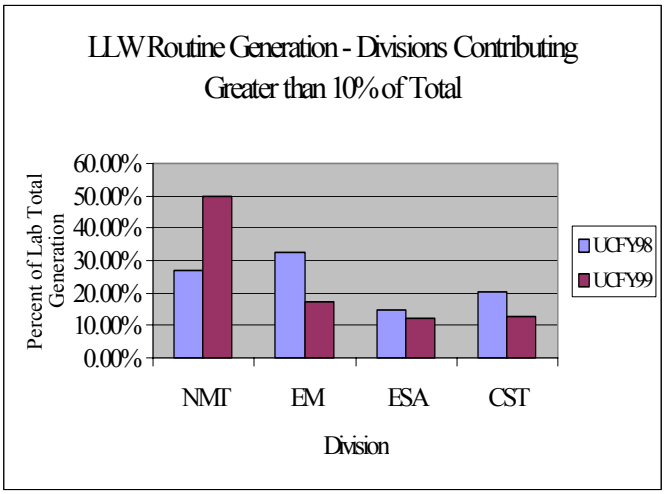


Figure 7. E-Division Performance Measure for Low Level Waste Generation

To benchmark its success, E Division reviews performance in environmental areas such as waste minimization. In 1999, one of the Laboratory's goal for Appendix F was to reduce low level waste generation by 10%. E Division assessed its overall contribution to this wastestream and reduced E Division's generation by 28% compared to 1998 as shown in Figure 7. (E Division was previously called EM Division.)

As discussed in section 6.2, E-Division compared their TRU waste characterization technology to private and public sector technology. As illustrated below, the Division's technology rated higher than

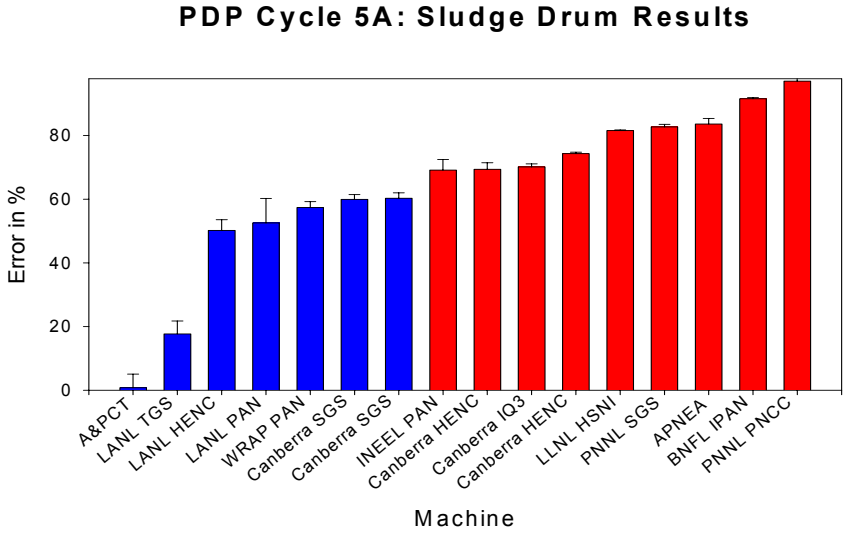


Figure 8. Comparison of E-Division Waste Characterization Technology to Private and Public Sector Technology

other technologies. Additionally, the Division conducted similar sensitivity tests to these that were used to complete the entire benchmark evaluation and justify selection of LANL technology for the national TRU program.

MWAs provide an opportunity for management to view the working environment, target concerns and issues, and discuss with employees their concerns and issues. MWAs are also key to assess workplace safety. Figure 8 shows how the Division benchmarks its success for MWAs by comparing itself to other divisions at the Laboratory. The Division's MWA rate is at 130% of the actual goal. This demonstrates E Division managers' commitment to environment, safety, and health.

E-Division closely monitors its injury/illness rate through several measures. Figure 9 shows a rolling 12-month average for total recordable incident rate (TRI) and lost workday case rate (LWC) and compares E-Division's performance to overall LANL performance. Information on trends in worker safety alerts managers to areas for improvement and shows the impact of implementing measures to prevent accidents. The TRI and LWC rates for the Laboratory and the Division are shown below for comparison. Figure 9 shows the number of total recordable incidents and lost workday cases for the past year.

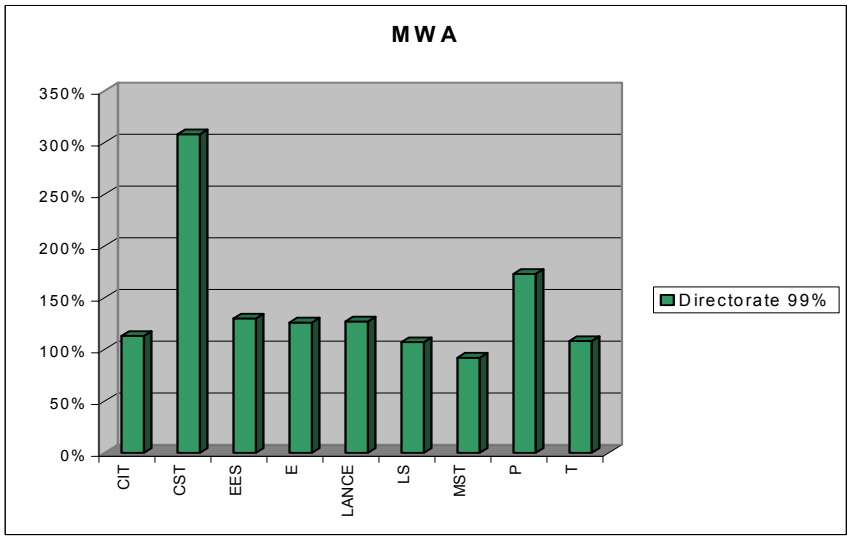


Figure 9- MWA Rate

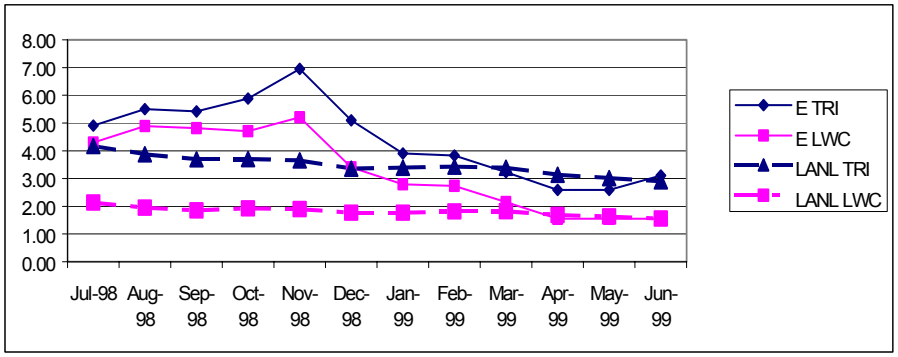


Figure 10 – TRI and LWC Rates for E Division compared to the Laboratory

Figure 10 shows E-Division's performance related to affirmative procurement. E Division's use of materials comprised of recycled materials is increasing annually. This is a LANL-wide effort to purchase products with recycled content. Information about this program is discussed in the Business Overview and Category 3. In 1998, the Division's overall rate was 55%; in 1999 the rate improved dramatically to 70%.

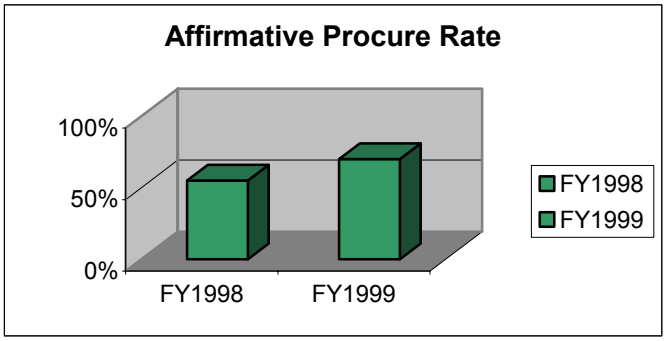


Figure 11 – Affirmative Procurement Rate for E Division

Figure 11 shows LANL's overall score on the utilities/energy conservation measures of Appendix F. The scores were initially high, yet have maintained an improving trend. Appendix F is discussed throughout this application. E-Division contributes to this score, but current LANL infrastructure limitations prevent the division from identifying a unique, quantifiable contribution. However, as mentioned in Category 5, E Division has presented information about energy conservation to all employees at the Laboratory.

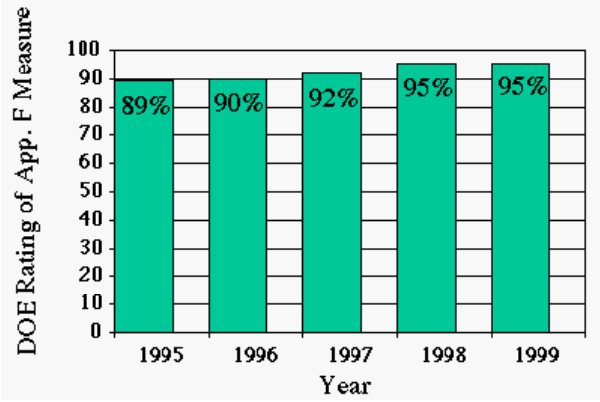


Figure 12 - LANL's Appendix F scores related to utilities/energy conservation

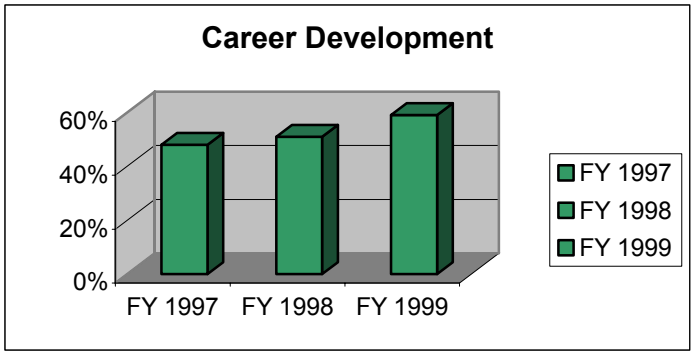
7.2 Customer, Supplier, Employee and Other Results

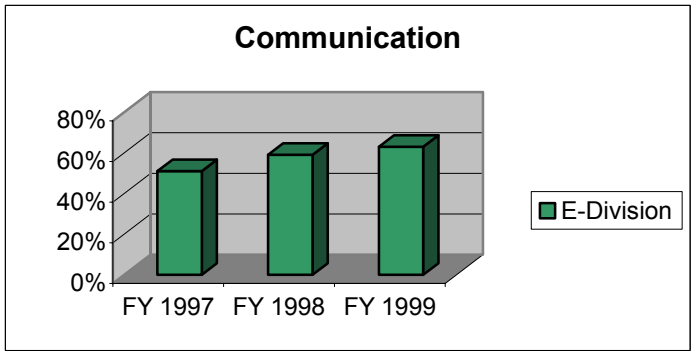
E-Division uses the Appendix F Process as a way to identify DOE's customer requirements and to gather feedback regarding division performance. In Category 7.1, E Division's lead in the Laboratory's

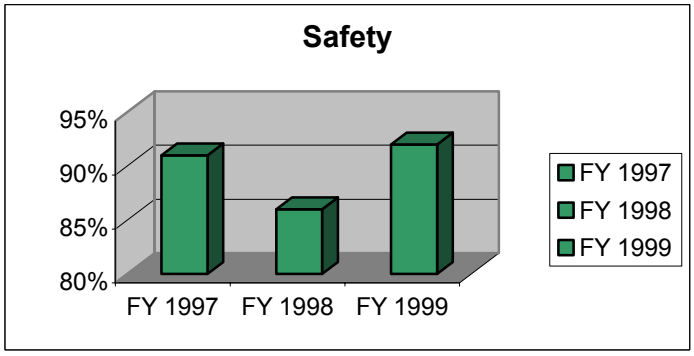
affirmative procurement program was discussed. The Laboratory's affirmative procurement purchase rate has increased from 40% in 1997 to over 80% in 1999.

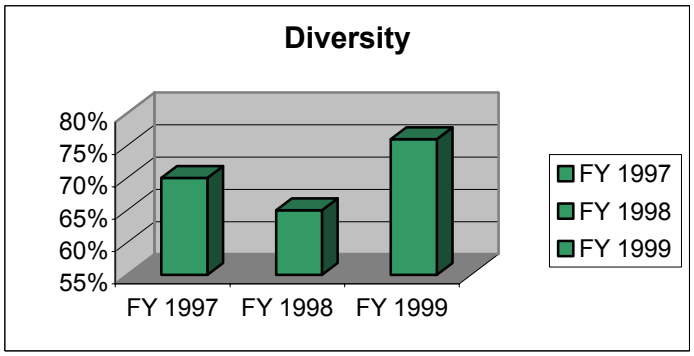
As shown in Figure 6 in Category 7.1, the Laboratory's overall rating for Appendix F measures is increasing. This trend can be attributed to several factors such as the ISM program. Employees' involvement in ISM is an essential factor to its success and can be shown by the Laboratory's low TRI and LWC rates.

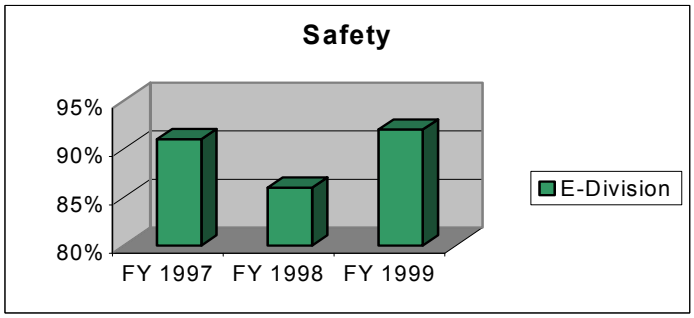
Below are the results for E-Division's 1999 Checkpoint Survey. The processes discussed in 5.0 contribute to the increased levels of employees' satisfaction with the Division. For example, E Division employees' satisfaction is increasing in the areas of career development and communication. However, E Division continues to improve their processes in these areas.











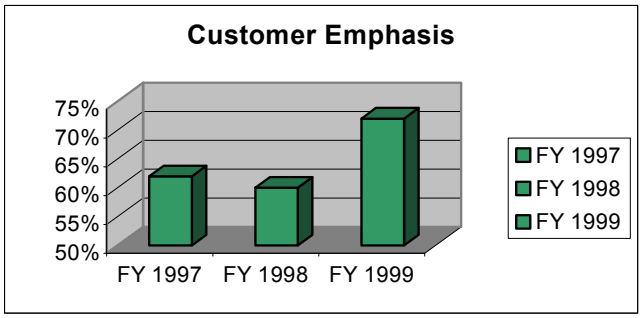


Figure 13. - 1999 Checkpoint Survey Results

As discussed in section 3.2, E-Division sponsors and facilitates programs with the sub-contractors to reduce waste streams. By working with JCNNM, E Division helped implement a Laboratory cardboard

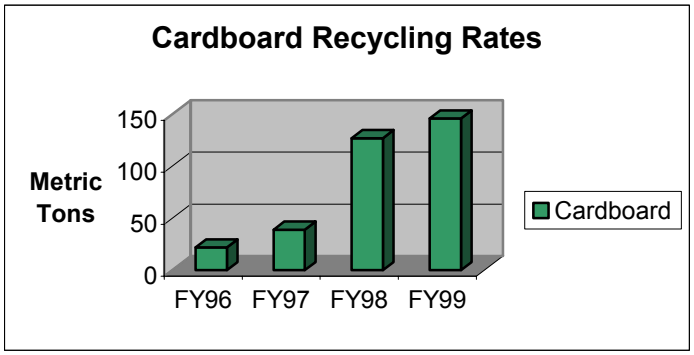


Figure 14. - Lab cardboard recycling rates

recycling program. As illustrated in figure 14, the cardboard recycling program has been successful in reducing the Laboratory's cardboard waste.

Figure 15 shows trends in public perception of LANL's environmental performance. As stewards of the environment and a community member, the Laboratory strives to increase its integrity with the community through activities such as E/ER staff involvement with the CAB as discussed in Category 1.2. Information in this particular format is not available for 1999 because LANL changed the survey questionnaire temporarily. Information for this trend analysis will resume in February.

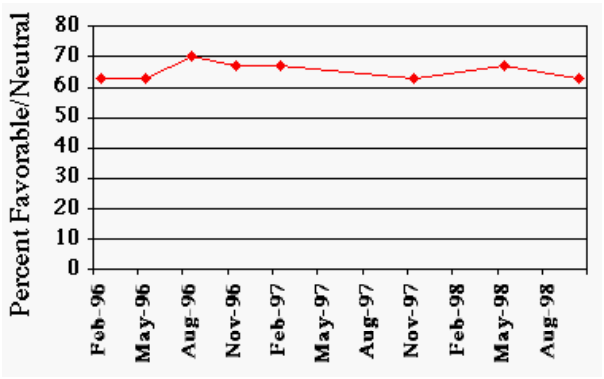


Figure 15 - Percentage of NM Residents Who View LANL Environmental Performance as Favorable or Neutral.

7.3 Financial Results

E Division is a leader at the Laboratory for funding institutional projects for prevention efforts, which lead to cost savings and cost avoidance. The GSAF Program, as discussed in the Business Overview, promotes a pollution prevention ethic by sponsoring Laboratory-wide programs, which tax funds spent for waste disposal to use as a funding source for projects, which minimize wastes. The GSAF program

has increased funding for pollution prevention projects from $400k in 1996 to $777k in 2000. For example, one of the twenty projects funded in 1999 purchased new photodeveloping equipment for the Laboratory. This project required an investment of $33k and will avoid more than 3000 kilograms per year of RCRA waste and reduce water usage by 247,500 gallons per year.

One of the Laboratory's Appendix F Performance Measures is in cost reductions. The measure includes cost savings for all productivity improvements. The performance measure compares the approved baseline activities' costs and schedules. E/WM achieved outstanding ratings in 1996-1998. E/WM demonstrated between 6-7% reduction in actual costs compared to planned costs. In 1999, E/WM received an excellent rating and demonstrated a 4% reduction.

As stated in Category 4.2, E Division used the Green Zia assessments to determine extent and efficiency of purchasing computers to develop steps for reducing this waste. The data below shows computer purchases consistently peak at the end of the fiscal year (September). This is an example of how the Division uses financial information to develop conservation strategies.

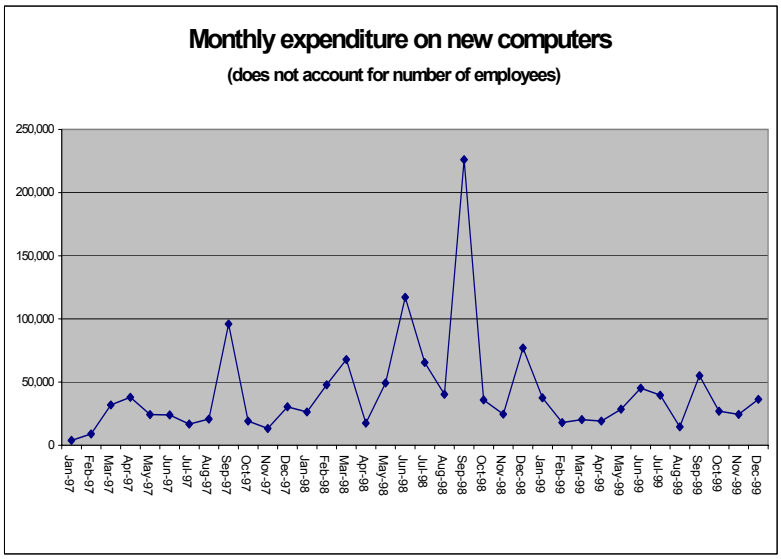


Figure 16. - Computer Purchasing Trend

Acronyms

Acronym	Definition
AA	Audits and Assessments Office
BUS	Business Operations Division
CAB	Citizen Advisory Board
CIC	Computing, Information and Communications Division
CQT	Continuous Quality Tools
CY	cubic yards
DPA	Distinguished Performance Awards
E/ER	E Division's Environmental Restoration Project
E/ESO	E Division's Environmental Stewardship Office
E/ET	E Division's Environmental Technology Group
E/PPC	E Division's Project, Planning, and Controls Office
E/ST	E Division's Science and Technology Program
E/WM	E Division's Waste Management Program
EAC	Employee Advisory Council
EE	Environmental Excellence
EPA	Environmental Protection Agency
ES & H	Environment, Health and Safety, and Health Division
FIMAD	Facility for Information Management, Analysis and Display
FTE	Full-time equivalent (employee)
GSAF	Generator Set-Aside Fee Program
ISM	Integrated Safety Management
ISM	Integrated Safety Management
ISM/EE	E Division's Integrated Safety Management Plan with Environmental Excellence
I-Track	Laboratory wide action tracking system
JCNNM	Johnson Controls Northern New Mexico
LAAP	Los Alamos Awards Program
LANL	Los Alamos National Laboratory
LWC	lost workday case rate
MDA	Material Disposal Area
MWA	Management Walkarounds
NMED	New Mexico Environment Department
NRC	Nuclear Regulatory Commission
OSHA	Occupational Safety and Health Administration
P2	pollution prevention
PRS	Potential Release Site
RCRA	Resource Conservation and Recovery Act
SAR	Safety Analysis Report
SWB	Standard waste boxes
TRI	total recordable incident rate